MANUEL DE VOL

Piper PA-18

F-GLLN
N° 18-3447

Annexe 1

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Cet intercalaire doit obligatoirement être inséré devant la page de garde d'un manuel de vol en langue anglaise

AVERTISSEMENT

Le présent document en langue anglaise est le manuel de vol approuvé par l'Agence européenne de la sécurité aérienne.

En application des dispositions de l'arrêté du 24 juillet 1991 relatif aux conditions d'utilisation des aéronefs civils en aviation générale (« Un vol ne peut être entrepris que si, d'une part les membres d'équipage sont familiarisés avec l'aéronef et son équipement de bord, notamment le matériel de sécurité-sauvetage et les systèmes spéciaux, et d'autre part ont une connaissance pratique de son manuel de vol ou des documents acceptés comme équivalents. »),

Nul ne peut utiliser l'aéronef avec ce seul document s'il n'a pas une connaissance suffisante de la langue anglaise.

A défaut, il appartient au propriétaire ou à l'exploitant de l'aéronef de se procurer une traduction de ce document sous sa responsabilité.

Référence : Instruction du 13/11/2009 relative à la langue des manuels de vol

APPROVAL OF MINOR MODIFICATION

To: N C L Wright
Arrow Air Services
Shipdham Airfield
Shipdham
Norfolk
IP25 7SB

Modification Approval No: 9/223/1559

Office of Issue: **STANSTED**

Aircraft Type:	Aircraft Registration:	Applicant's Modification No:
Piper PA18 Super Cub	**G-BLLN** Serial No: 18-3447	- Issue No: -

Details of Modification:

Install: Continental 0-200A Engine in place of Continental C90

In accordance with AAN 18435 and CAA AIRCRAFT PROJECTS Departmental letter dated 7 July 1994 (A.CARTER)

Suitable for installation in this aircraft only

Limitations, Conditions or Exemptions
-

Amendments in accordance with BCAR, Section A and B, as appropriate, are required to the following documents:*

Weight and C of G Schedule	Repair Manual
Flight Manual	Maintenance Schedule
Maintenance Manual	Crew Manual
Overhaul Manual	Electrical Load Analysis

The above modification is approved and may be embodied subject to compliance with British Civil Airworthiness Requirements.

Signed: [signature]

Name: **J Tearne** Date: **27 October 1994**

£53.00

Received by: VF

Date:21.9.94

Receipt No: 248046

* *(Delete as appropriate)*

cc: Aircraft Projects Department, 2E
Applications and Certification Section, 2W
File Copy

AD261
040194

Export Certification No.

"This is the flight manual which forms part of Certificate of Airworthiness FOR AIRCRAFT G-BLLN 13-9-91

APPROVED
FLIGHT MANUAL
FOR THE
PIPER PA-18

IDENTIFICATION NO.
18-3447
G-BLLN.

J. W. Mallary
Assistant Chief Engineer
Piper Aircraft Corporation
Lock Haven, Pennsylvania
DMCR 1-1

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CAA APPROVED CHANGE SHEETS & SUPPLEMENTS
FOR EMBODIMENT IN THIS MANUAL

DATE	ORIGIN AND TITLE	APPROVAL AUTHORITY	POSITI IN MA
22/5/80	CAA Change Sheet 1 issue ~~6~~ 7. Cancelled 13202 21/12/97	CAA	facin page
25/7/85	CAA Change Sheet 2 issue 1	CAA	facin page
2/09/94	CAA Supplement No 1 issue 1.	CAA	Facin Page 9
2/09/94	CAA Supplement AWN 98	CAA	AT REF FLT MA

C O N T E N T S

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SECTION I

I N.T R O D U C T O R Y

THE DOCUMENT REFERENCE NUMBER OF THIS FLIGHT MANUAL IS

PREFACE

This flight manual applies only to the aircraft having the constructor's No. 18-3447 and it is the responsibility of the flight crew operating the aircraft to be familiar with the contents of the manual including all amendments at the time of flight The amendment state of this manual is given on the amendment record sheets.

Amendments are of two kinds:-

(a) 'General' which at the date of issue affect all manuals bearing the same document number.

(b) 'Particular' which only affect manuals relating to particular aircraft and usually result from the incorporation of a modification. (The 'Particular' amendment record sheet will therefore reflect any differences in the contents of one aircraft manual from another bearing the same document number).

Amendments to the text will be indicated by a marginal vertical line together with the amendment number, except that when a considerable change has taken place or a completely new page has been issued the revision, together with the amendment number, will be denoted at the foot of the page. Changes to the weight schedule page, radio station details, maximum number of seats (Section 11) and weight and loading data (Section V1) are not associated with an amendment number.

Amendments to the flight manuals of aircraft registered in the United Kingdom are incorporated on the authority of the Ministry of Aviation by a representative of the Air Registration Board and no changes whatsoever may be made to the contents of this manual by any other person

Notes

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REPORT 1107

PAGE 4

MODEL PA-18

GENERAL AMENDMENT RECORD SHEET

Amendment Number	Title of Amendment	APPROVAL/ DATE	Pages Affected
1	Clarify the Datum		4 and 13 13a Added
2	Correct En Route Climb Speed	11/21/90	49
3	Clarify Datum and Correct Lever Arms	Wm. R. Moran 6/25/92	13, 13a, and 54

*NOTE: See page 3 for explanation of 'General' Amendments. This amendment record sheet will be re-issued with each 'General' Amendment.

Revised 6/24/92

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PARTICULAR* AMENDMENT RECORD SHEET

Amendment Number**	Description of Amendment and (if applicable) the associated Mod. number	Pages Affected	Signature	Date of Incorporation of Amendment
1	Flight by Night	21		1/12/62

* Note: See Page 3 for explanation of "Particular" Amendment.

** Note: Amendment numbers will not always be consecutive.

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PARTICULAR* AMENDMENT RECORD SHEET (Continued)

Amendment Number	Description of Amendment and (if applicable) the associated Mod. number	Pages Affected	Signature	Date of Incorporation of Amendment

*Note: See Page 3 for explanation of "Particular" Amendments.

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REGISTRATION PARTICULARS

G-BLLN

NATIONALITY AND REGISTRATION MARKS

G-BLLN

CONSTRUCTORS NO.

18-3447

DESIGNED AND CONSTRUCTED BY:-

PIPER AIRCRAFT CORPORATION
LOCK HAVEN, PENNSYLVANIA

CONSTRUCTED IN THE YEAR 1954 AT:-

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SECTION 1J.

D E S C R I P T I O N

Notes

Page numbers required

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SECTION 11

D E S C R I P T I O N

SPECIAL CONDITIONS OF FLIGHT

ICING CONDITIONS

See Section 111

CLIMATIC CONDITIONS

The operating suitability of the aeroplane has been established for temperatures up to the range defined by the I.C.A.O.
Temperate and Artic Maximum
This temperature range is shown in Figure 2-1 on page 10 of this manual.

No minimum temperature range has yet been established.

AEROPLANE PARTICULARS

CLASS

Land plane High - wing monoplane

ENGINE

Number	One
Manufacturer	~~Continental~~ Rolls Royce
Type	~~C-90-12F or C-90-8F~~ O-200A

PROPELLER

Manufacturer	~~Sensenich~~ McCauley
Type	~~M76 AK-2~~ 1A/101/DCM
Diameter	~~74 ins.~~ 69"
Pitch	~~42 ins.~~ 48"

LEADING DIMENSIONS

Figure 2-2 on page 11 is a three-view general arrangement drawing, and associated dimensions are shown on page 12.

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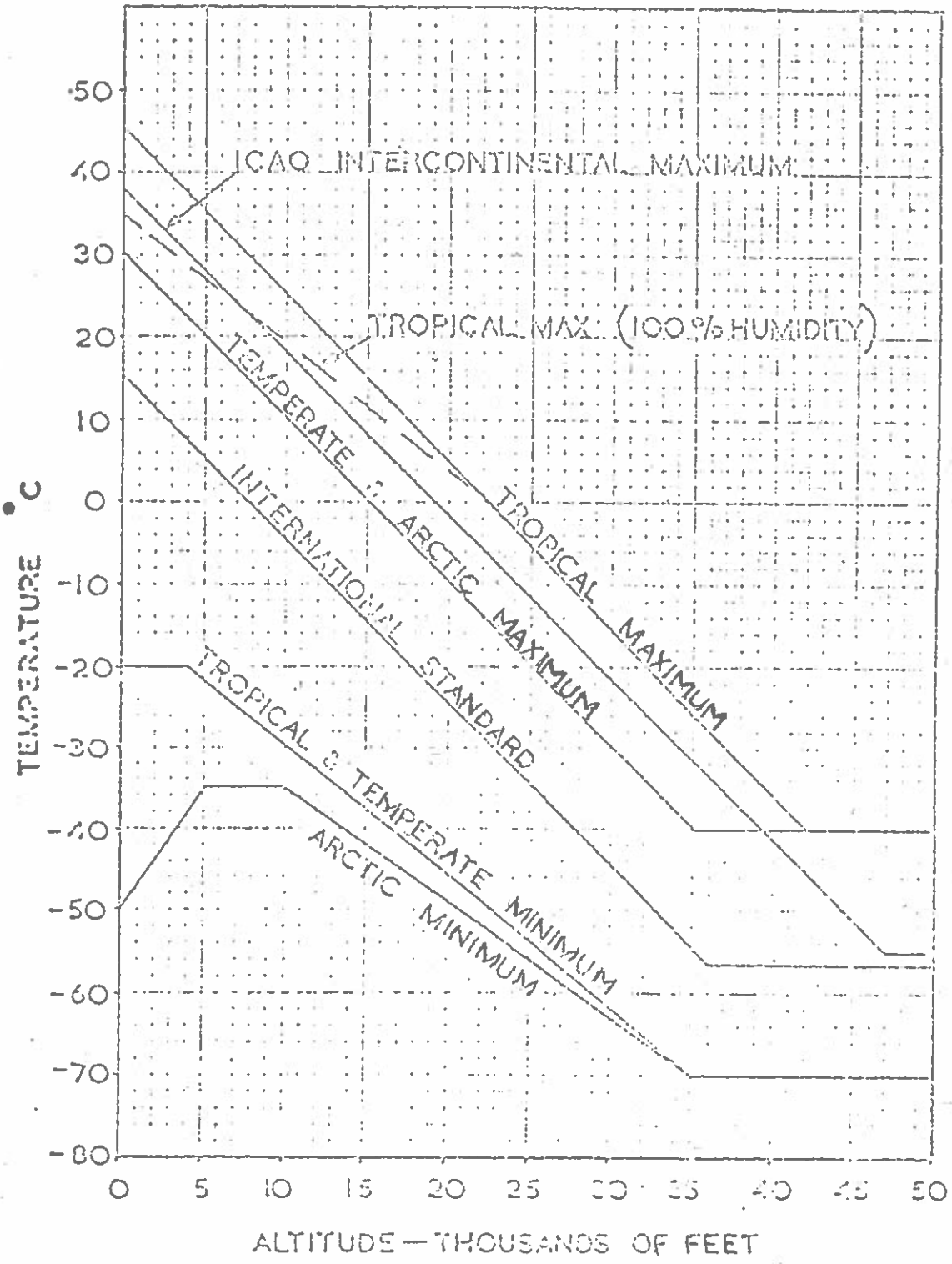
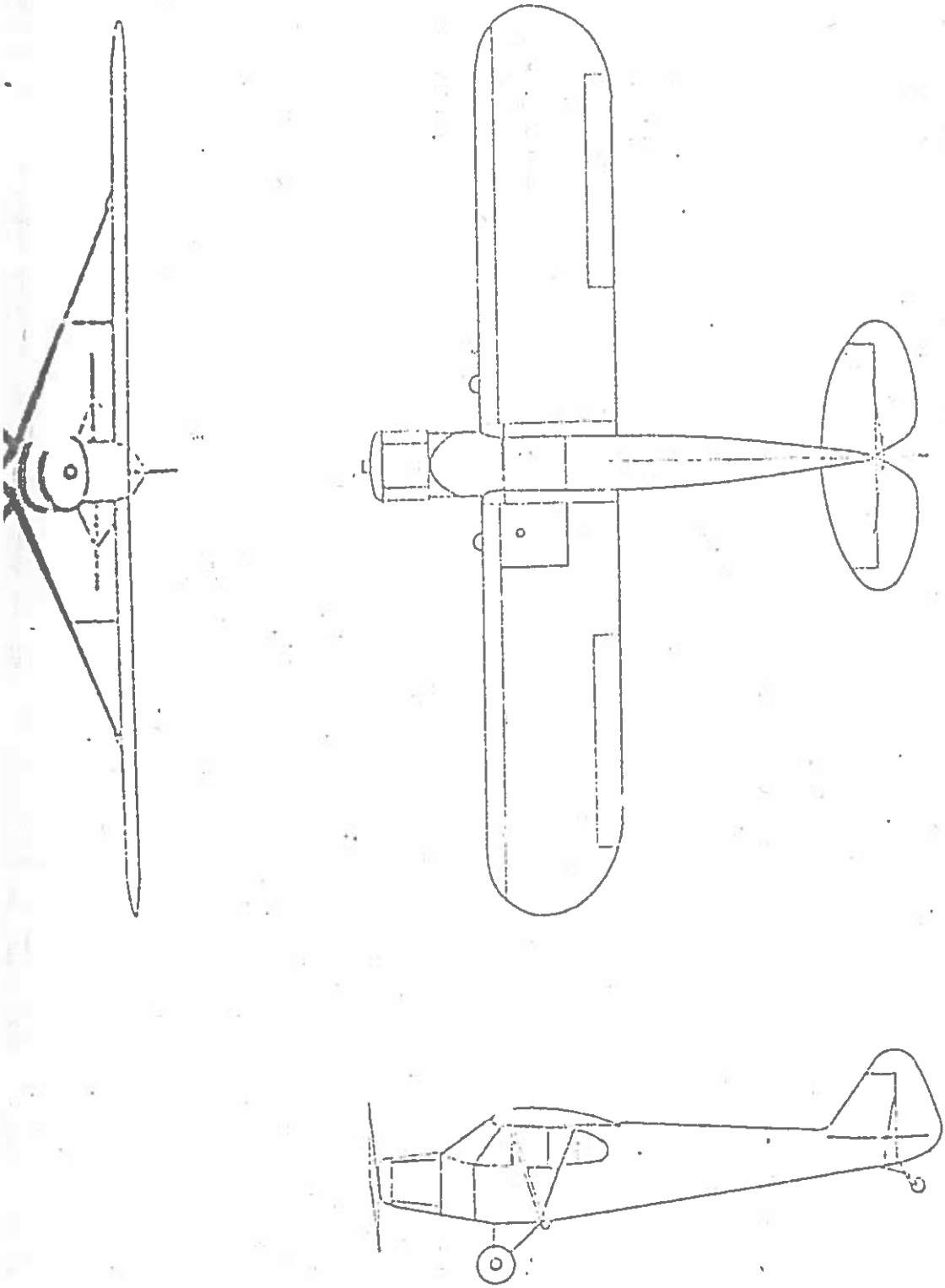


STANDARD ATMOSPHERES

FIG 2-1



LEADING DIMENSIONS

Span	35 ft. 2 1/2 ins.
Length	22 ft. 4 ins.
Height	6 ft. 7 1/2 ins.

WING

Area	178.5 sq. ft.
Mean chord	5.25 ft.
Aspect ratio	6.7
Aileron area (total)	18.8 sq. ft.

TAIL UNIT

Tailplane area	26.8 sq.ft.
Elevator area	11.68 sq.ft.
Fin area	4.7 sq.ft.
Rudder area	6.8 sq.ft.

MISCELLANEOUS

Undercarriage track	6 ft. 0 1/2 ins.

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WEIGHT SCHEDULE

1. Weight of aircraft empty.....lb

   This empty weight includes the following items:-

   (i) The weight of all fixed ballast, if any is fitted

   (ii) The weight of all accessories, instruments, and apparatus, including radio apparatus, which are listed as forming part of empty weight in the Weight Schedule carried in the aircraft.

2. Weight of fuel with tanks full (capacity of .....Imp. gallons) at 7.2 lb. per Imp. gallon.....lb

3. Weight of oil with tanks full (capacity of .....Imp. gallons) at 9.0 lb. per Imp. gallon.....lb

4. Weight of minimum crew at 170 lb. each member.....170.....lb

5. Weight of removable equipment (See Table 1 in Section VI).....lb

6. Weight of removable radio apparatus (See Table 1 in Section VI).....lb

7. Maximum commercial load authorised, when the fuel and oil tanks are full calculated on the weight specified above.....lb

8. Maximum authorised weight of the aircraft.....lb

Centre of gravity of the aircraft at the weight empty is.....inches aft of the datum.

The datum is defined as the wing leading edge. Refer to sketch on Page 13a.

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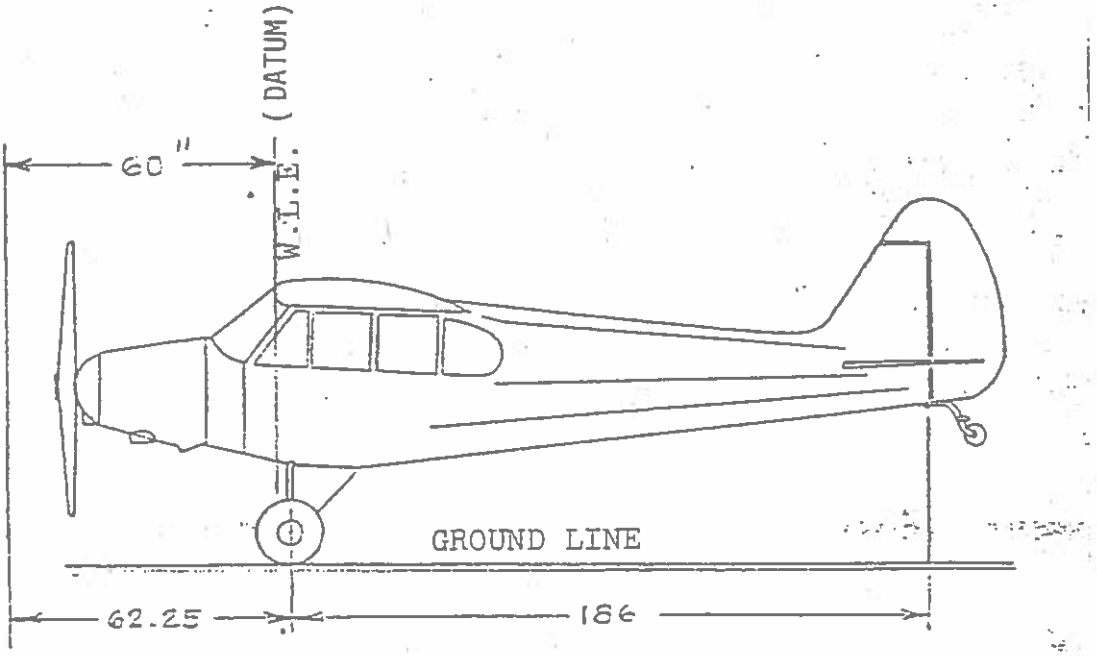

Revised 6/24/92

MAXIMUM NUMBER OF SEATS

The maximum number of seats authorised to be fitted, including seats for the crew is 2. The limitation relating to the maximum number of occupants is given in the miscellaneous limitations in Section 111 of this manual.

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SECTION III

L I M I T A T I O N S

Contents

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SECTION 111

L I M I T A T I O N S*

THE AEROPLANE MUST BE OPERATED SO THAT THE LIMITATIONS AND INSTRUCTIONS IN THIS SECTION ARE OBSERVED

CATEGORY

The aeroplane is certified in the Normal and Semi-Aerobatic Categories, sub-divisions:-

(a) Public transport for passengers
(b) Public transport for mails
(c) Public transport for goods
(d) Private
(e) Aerial work
(h) Demonstration
(i) Crew familiarisation

MANOEUVRES (NORMAL CATEGORY)

Operation is limited to normal flying manoeuvres. Aerobatic manoeuvres are not permitted. The maximum positive accelerations which the structure has been designed to withstand withour permanent deformation are 4.4. Intentional manoeuvres shall be confined to those with load factors below these maximum values.

MANOEUVRES (SEMI-AEROBATIC CATEGORY)

When operating in the Semi-Aerobatic Category the following manoeuvres are permitted:-

Chandelles
Lazy Eights
Steep Turns
Spins

The maximum positive accelerations which the structure has been designed to withstand without permanent deformation are 4.5. Intentional manoeuvres shall be confined to those with load factors below these maximum values.

*Certain of these limitations are shown in the table of 'Principle Limitations' on page 22.

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AIRSPEED LIMITATIONS

*NEVER EXCEED SPEED

The never exceed speed is an airspeed indicator of 138 miles per hour (120 knots).

*NORMAL OPERATING LIMIT SPEED

During normal cruising flight the aeroplane shall not be flown at a speed greater than an airspeed indicator reading of 110 miles per hour (96 knots).

The aeroplane shall only be flown at speeds between the normal operating limit speed and the never exceed speed at the discretion of the pilot, having due regard to the prevailing flight and atmospheric conditions.

MANOEUVRING SPEED

Manoeuvres involving an approach to the stall or full application of aileron or rudder control shall not be undertaken when the aeroplane is flying at a speed greater than an airspeed indicator reading of 94 miles per hour (82 knots).

NOTE: Although the aeroplane is strong enough for steady application of full rudder control at this speed, a violently checked manoeuvre might over-stress it. For example any violent yaw must not be checked with sudden application of opposite rudder.

AIRSPEED INDICATOR COLOUR MARKINGS

Flaps up.	Normal operating range	to 110 m.p.h.	(Green Arc)
	Caution	110 to 138 m.p.h.	(Yellow Arc)
	Never exceed speed	138 m.p.h.	(Red Line)

*To be placarded

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POWER PLANT LIMITATIONS

FUEL

The minimum grade of fuel approved for use with this engine is 80/87 octane.

OIL

The oil approved for use with this engine is to Specification D Eng. R.D. 2472 B/6

OIL TEMPERATURE

Normal operating range	75 to 225°F	(Green Arc) ✓
Caution	75 to 90°F	(Yellow Arc) ✓
Maximum	225°F	(Red line) ✓
Minimum	75°F	(Red line) ✓

OIL PRESSURE

Normal operating range	30 to 60 lb/sq.in.	(Green arc) ✓
Caution	10 to 30 lb/sq.in.	(Yellow arc) ✓
Maximum	60 lb/sq.in.	(Red line) ✓
Minimum	10 lb/sq.in.	(Red line) ✓

ENGINE SPEED LIMITATIONS

The maximum permissible rotational speed for all conditions of flight is 2750 r.p.m. (Red line). ✓ The normal operating range is from 2000 r.p.m. to 2550 r.p.m. (Green arc). ✓

USE OF MIXTURE CONTROL

The mixture control is only to be used to maintain "Weakest mixture for maximum power" conditions when cruising at altitudes greater than 5,000 feet, or to avoid rough running due to over-richness in all other power conditions and must not be used to cause a drop in engine speed.

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CIVIL AVIATION AUTHORITY

CAA Supplement No 1 Issue 1 to FAA-approved PA18 Flight Manual Report No.1107.

Piper PA18 (modified)	Constructor's Serial No. 18-3447	Registration Marks G-BLLN

ROLLS ROYCE O-200A ENGINE

When a Rolls Royce O-200A engine is fitted, the following amendments to Flight Manual Report No.1107 are required, and a placard must be fitted in the cockpit stating:

> "This aircraft has been modified and its performance is affected: refer to CAA Supplement 1 Issue 1 to Flight Manual Report No.1107."

Allowance must not be made for any performance increment conferred by this modification.

SECTION II - DESCRIPTION

Page 9

ENGINE	Number	One
	Manufacturer	Rolls Royce
	Type	O-200A
PROPELLER	Manufacturer	McCauley
	Type	1A/101/DCM
	Diameter	69"
	Pitch	48"

SECTION III - LIMITATIONS

Page 18

OIL TEMPERATURE	Normal operating range	75° to 225°F (Green Arc)
	Caution	75° to 90°F Caution
	Maximum	225°F (Red Line)
	Minimum	75°F (Red Line)
OIL PRESSURE	Normal operating range	30 to 60 PSI (Green Arc)
	Caution	10 to 30 PSI (Yellow Arc)
	Maximum	60 PSI (Red Line)
	Minimum	10 PSI (Red Line)

ENGINE SPEED LIMITATIONS

The maximum permissible rotational speed for all conditions of flight is 2750 RPM (Red Line). The normal operating range is from 2000 RPM to 2550 RPM (Green Arc).

Page 22

POWER PLANT

Maximum Rotational Speed for All Operations	2750 RPM.
Normal Oil Pressure	30 to 60 PSI.
Minimum Safe Oil Pressure	10 PSI.
Maximum Oil Temperature for Opening Up Cold	70°F.

To be inserted at end of Flight Manual.

5 June 1984

AIRFRAME LIMITATIONS (NORMAL CATEGORY)

WEIGHT

The maximum permissible take-off and landing weight is 1500 lb. (680 kg)

This is the maximum weight and lower weights may in particular circumstances be advised or enforced by operational performance considerations.

CENTRE OF GRAVITY

The load is to be distributed so that the centre of gravity lies always between a forward limit of:-

11.5 ins. aft of datum at 1200 lb) With linear extrapolation
14.0 ins. aft of datum at 1500 lb) at intermediate weights and an aft limit of 21 ins. aft of datum at all weights

The datum is defined on page 13.

*FLOOR LOADING

The maximum permissible intensity of loading on the floor of the rear cabin is 14.75 lb/sq.ft.

*BAGGAGE

The maximum weight of baggage in the baggage compartment/rear cabin must not exceed 50 lb. (22 kg)

*To be placarded.

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AIRFRAME LIMITATIONS (SEMI-AEROBATIC CATEGORY)

WEIGHT

The maximum permissible take-off and landing weight is 1400 lb. (635 kg)

This is the maximum weight and lower weights may in particular circumstances be advised or enforced by operational performance considerations.

CENTRE OF GRAVITY

The load is to be distributed so that the centre of gravity lies always between a forward limit of:-

11.5 ins. aft of datum at 1200 lb) With linear extrapolation

13.2 ins. aft of datum at 1400 lb) at intermediate weights and an aft limit of 19 ins. aft of datum at all weights.

The datum is defined on page 13.

*BAGGAGE

Baggage must not be carried when operating in the Semi-Aerobatic Category.

---

*When flown solo the front seat must be occupied.

*To be placarded.

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MISCELLANEOUS LIMITATIONS

MINIMUM CREW

The minimum crew is one pilot.

NUMBER OF OCCUPANTS

The number of persons carried must not in any circumstances exceed the number of seats stated on page 14, nor exceed that for which seating accommodation approved by the Minister of Aviation is provided, except that infants under the age of 3 years carried in the arms of passengers may be left out of account for this purpose.

*SMOKING

Smoking is not permitted.

FLIGHT BY NIGHT

Rev. 1

The aeroplane may fly at night when such a flight is permitted by, and the additional equipment is carried in accordance with, the relevant legislation.

FLIGHT IN ICING CONDITIONS

The aircraft is not approved for flight in icing conditions.

PLACARDS

Such notices as are required to be placarded, including those limitations in this section denoted by an asterisk, shall be visibly displayed.

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TABLE OF PRINCIPAL LIMITATIONS

AIRSPEED

	I.A.S.	
Never Exceed	138 m.p.h.	120 knots
Normal Operating Limit	110 m.p.h.	96 knots
Manoeuvring	94 m.p.h.	82 knots

POWER PLANT

Maximum Rotational Speed for All Operations 2750 r.p.m.

Normal Oil Pressure	30 to 60 lb./sq.in.
Minimum Safe Oil Pressure	10 lb/sq.in.
Minimum Oil Temperature for Opening up Cold	70°F

WEIGHT AND CENTRE OF GRAVITY

		Normal Cat.	Semi-Aerobatic Category
Maximum Take-off and Landing Wt.		1500 lb (680 kg)	1400 lb (635 kg)
Forward Limit at 1200 lb.	linear variation at intermediate weights	11.5 ins.	11.5 ins.
at Maximum Weight		14.0 ins.	13.2 ins.
Aft Limit		21.0 ins.	19.0 ins.

MISCELLANEOUS

Minimum Crew One Pilot
Smoking is Not Permitted

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SECTION IV

H A N D L I N G

Contents

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SECTION IV

HANDLING

MAXIMUM CROSSWIND COMPONENT

The maximum crosswind component in which the aeroplane has been demonstrated to be safe for take-off and landing is 10 knots at a lower height of 10 metres.

HANDLING ON ROUGH GROUND

The aeroplane has been demonstrated to be safe when operating from rough grass surfaces.

TAKE-OFF TECHNIQUE

The take-off safety speed is 51 m.p.h. (44 knots) I.A.S.

STABILITY

The aeroplane is stable about all three axes.

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STALLING

General

The stall is preceded by noticable airframe buffet. Provided the stall is carried out without yaw the nose drops gently with no tendency to drop either wing. Recovery is orthodox.

Stalling Speed

The variation of power off stalling speed with weight is shown in Figure 4-1.

STALLING SPEED

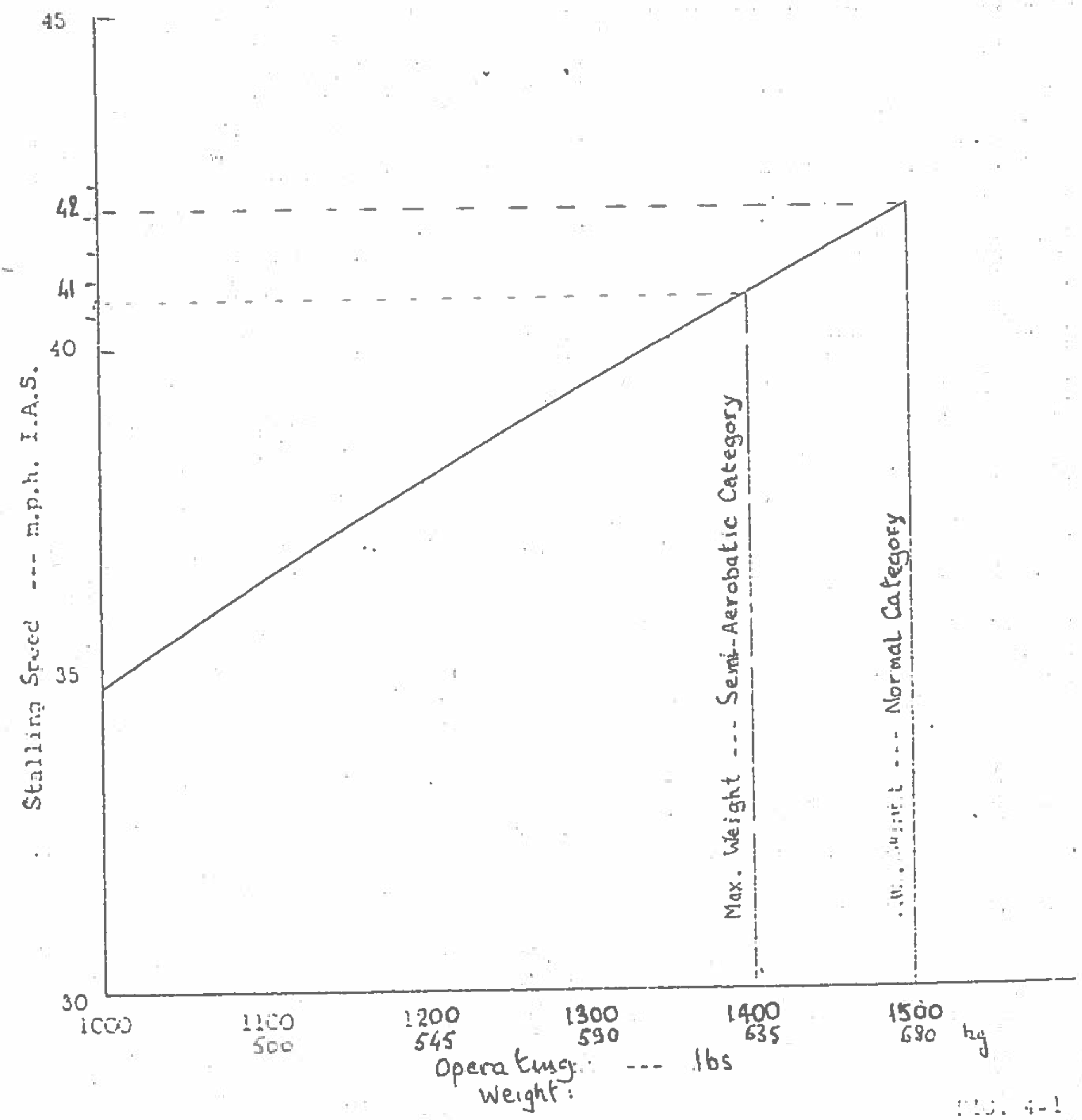

FIG. 4-1

SECTION V

P E R F O R M A N C E

Contents

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SECTION V

P E R F O R M A N C E

THIS AEROPLANE IS CLASSIFIED IN PERFORMANCE GROUP D

GENERAL

CONDITION OF AEROPLANE

The performance information in this section relates to an aeroplane in the following standard condition -

Engine	Continental C-90-12F or C-90-8F
Propeller	Sensenich M76 AK-2 Diameter 74 ins. Pitch 50 ins. NOTE: The performance information is no longer applicable if a propeller of another approved type, but having different diameter or pitch is fitted.
Airframe de-icing	None fitted
External Modifications	None NOTE: The performance information is no longer applicable if other external modifications (apart from radio aerials and navigation lights) are fitted.

AIRSPEEDS

The minimum control speeds, stalling speeds and safety speeds upon the basis of which this performance information was obtained are given in Section IV. When the airspeed is given in terms of I.A.S. (i.e. a reading on an instrument with no instrument error) and the error (which is always small) of a particular instrument is not know the actual instrument reading (i.e. A.S.I.R.) may be used.

STANDARD ATMOSPHERE

The International Standard Atmosphere (I.S.A.) is defined in Figure 2-1.

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FIGURE 5-1

DETERMINATION OF TEMPERATURE IN RELATION TO STANDARD

In order to convert a given temperature at a given altitude into degrees above International Standard Atmosphere (which is used throughout this section) the information in the chart opposite may be used.

The example given by the arrowed dotted line shows that a temperature of 11° Centigrade at an altitude of 8,000 feet is 12°C higher than the appropriate temperature in the International Standard Atmosphere.

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DETERMINATION OF TEMPERATURE IN RELATION TO STANDARD

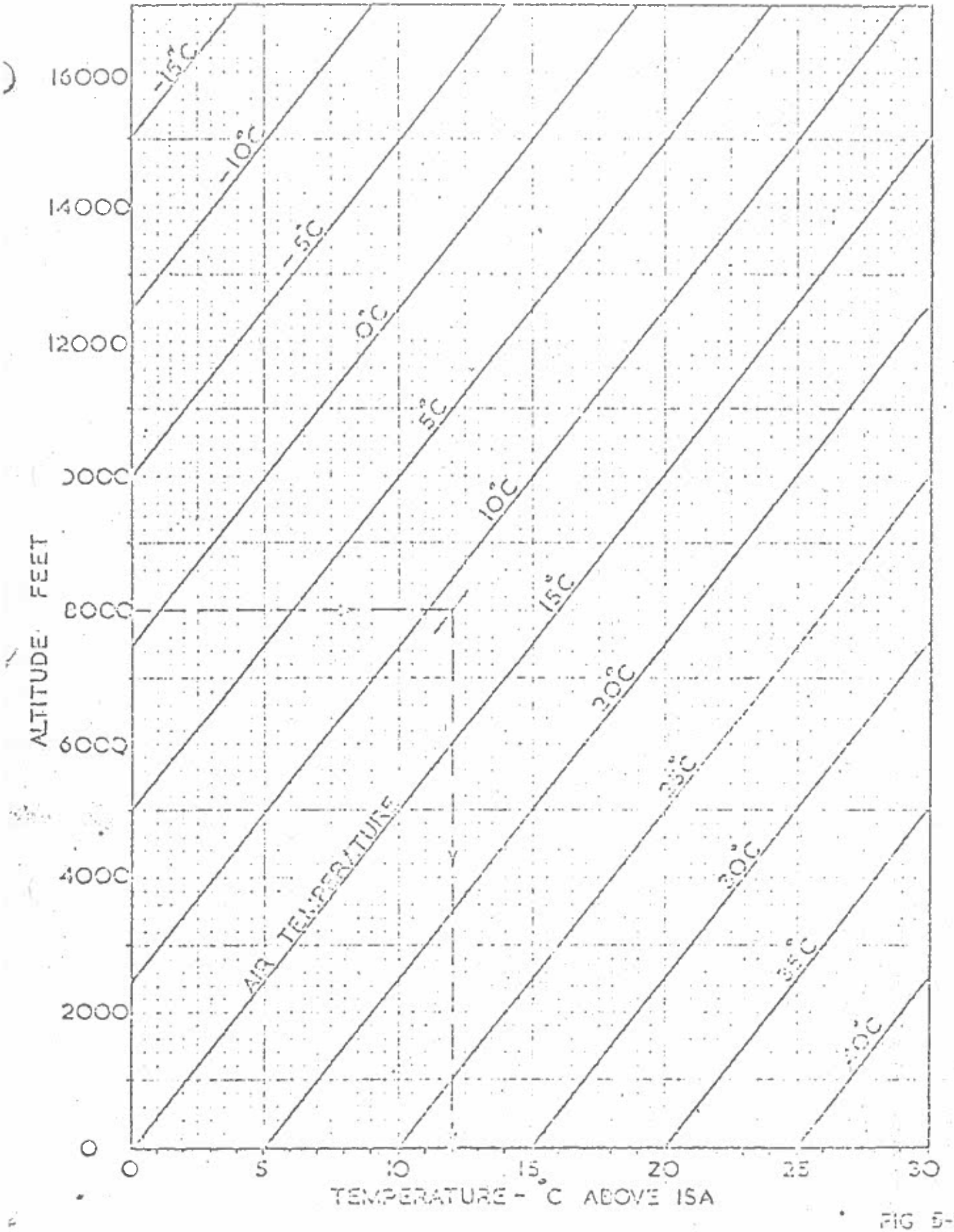

FIG 5-1

FIGURE 5-2

POSITION ERROR CORRECTION TO A.S.I.

The correction to be made to the I.A.S. (Indicated Airspeed) to obtain E.A.S. (Equivalent Airspeed) is given for values of I.A.S. and flap positions.

The correction applies only when the standard pitot-static head is used.

ALTIMETER STATIC ERROR CORRECTION

The altimeter static error correction is less than 60 feet in all conditions.

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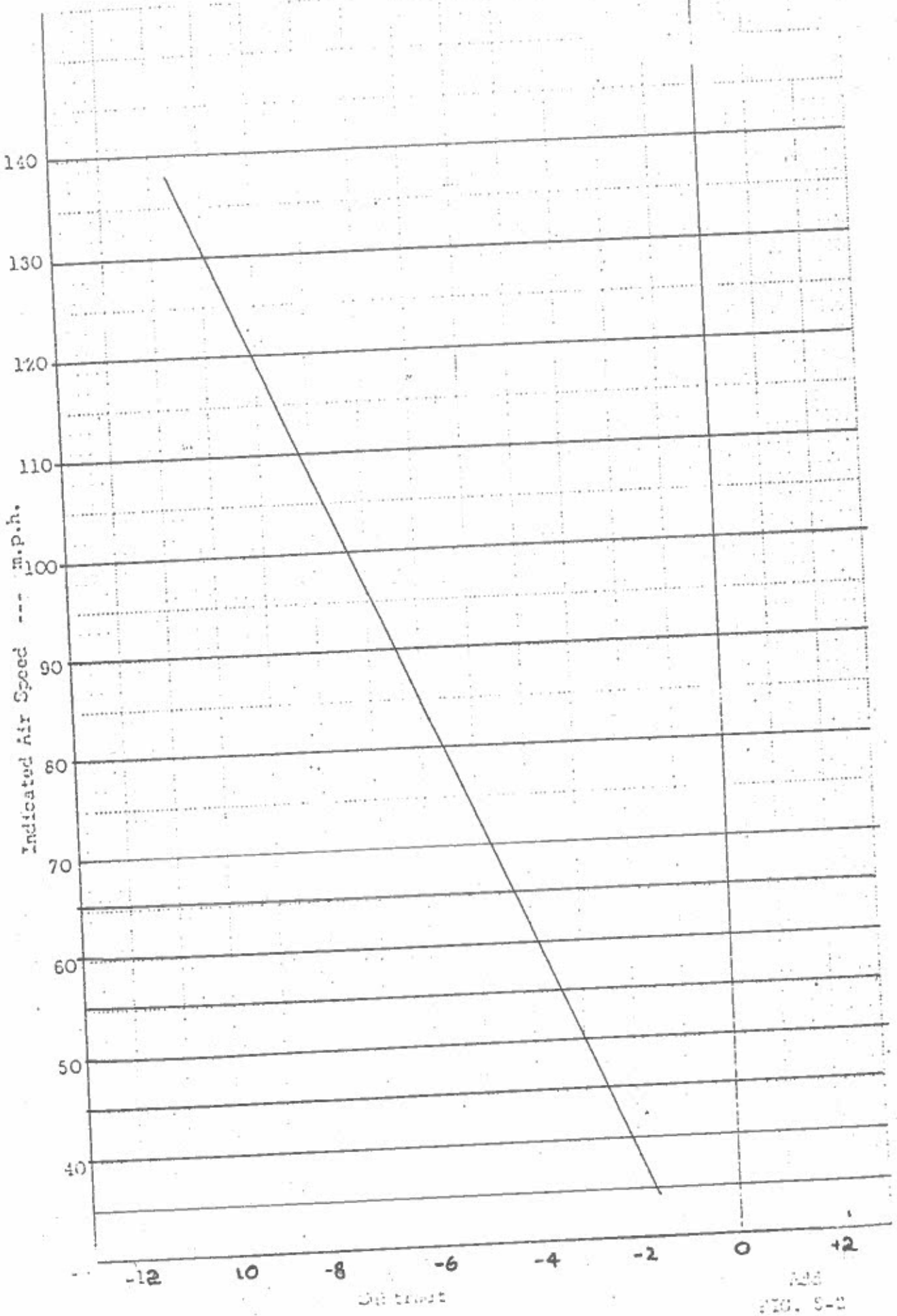
POSITION ERROR CORRECTION



NET DATA

The majority of the performance information scheduled (for example the take-off distance required) is 'net data'. This means that some margin has been included in the charts for the loss of performance due to various factors for which it is difficult to make an allowance operationally, such as small and unavoidable variations from the correct airspeed, and variations from the average airframe drag and engine powers etc.

Where necessary a note in the text indicates those charts or portions of charts which are not 'net data'.

VALIDITY OF PERFORMANCE INFORMATION

The performance information in this section is not valid:-

(a) If the total loaded weight exceeds the relevant maximum permissible take-off and landing weight appropriate to the altitude and temperature;

(b) If the temperature exceeds the temperature of the maximum atmosphere for which operating suitability has been established (see page 9);

(c) If readings from the charts are obtained by extrapolation (i.e. using values of parameters outside the range given on the charts), except as and when specifically permitted.

NOTE: When the temperature is below the range scheduled, the performance shall be assumed to be not greater than that obtained by using the temperature appropriate to the coldest atmosphere given on the chart being considered.

DEFINITIONS

Gradient of climb	For the purpose of constructing flight paths this may be taken as the ratio expressed as a percentage:- $\frac{\text{Change in height}}{\text{horizontal distance covered during the period of time considered.}}$
Hard, dry surface	A take-off or landing surface having a coefficient of rolling friction of about 0.025 (such as concrete or tarmacadam).

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MAXIMUM TAKE-OFF AND LANDING WEIGHT FOR ALTITUDE AND TEMPERATURE

Within the limits of altitude and temperature scheduled (3,000 feet and I.S.A + 15°C respectively, the maximum take-off and landing weight is 1500 lb. when operating in the Normal Category or 1400 lb. when operating in the Semi-Aerobatic Category.

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TAKE-OFF RUN REQUIRED

The take-off run required from rest to take-off safety speed is not scheduled but is always less than the take-off distance required.

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FIGURE 5-3
TAKE-OFF DISTANCE REQUIRED

The take-off distance required from rest to reach a height of 50 feet is shown on page 39 for varying weights, altitudes, temperatures and headwind components.

ASSOCIATED CONDITIONS:-

Power Unit	Full throttle.
Technique	The aeroplane is held down close to the ground until a speed of 51 m.p.h. (44 knots) is reached and then it is climbed away.
Runway	Hard, level dry surface.

EXAMPLE

Given	Aerodrome altitude	1000 feet
	Temperature	20 °C (I.S.A. + 7°C)
	Take-off weight	1250 lb. 567 kg
	Headwind component	7 knots
The take-off distance required is		640 feet. 195 m

NOTE

(1) The wind correction grid is unfactored. The reported wind will need to be factored as required in the relevant operating regulations to obtain the effective wind to be used in this chart. For example with a factor of 50% to be applied, a reported headwind component of 10 knots would result in an effective wind of 5 knots to be used in the chart.

As the effect of the tailwind component is not scheduled, the information given opposite is not valid for a down wind take-off.

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FIGURE 5-3

TAKE-OFF DISTANCE REQUIRED (Continued)

(2) Correction for the effect of runway surface gradient and grass surfaces. The following table shows the amount by which the take-off run required (given opposite) is increased-
(a) for every 1% uniform uphill gradient,
(b) when the take-off surface is grass.

		680 kg	567 kg
Weight - lb.		1500	1250
% increase per 1% uphill gradient	(sea level)	8.6	6.2
	(3000 feet)	10.2	7.3
% increase for grass surface	(sea level)	6.7	5.6
	(3000 feet)	7.5	6.3

The correction for uphill gradients is not applicable for gradients exceeding 2%.
Linear interpolation may be used.
As the effect of downhill surface gradient is not scheduled, the take-off distance appropriate to zero surface gradient is to be used when there is a downhill gradient.

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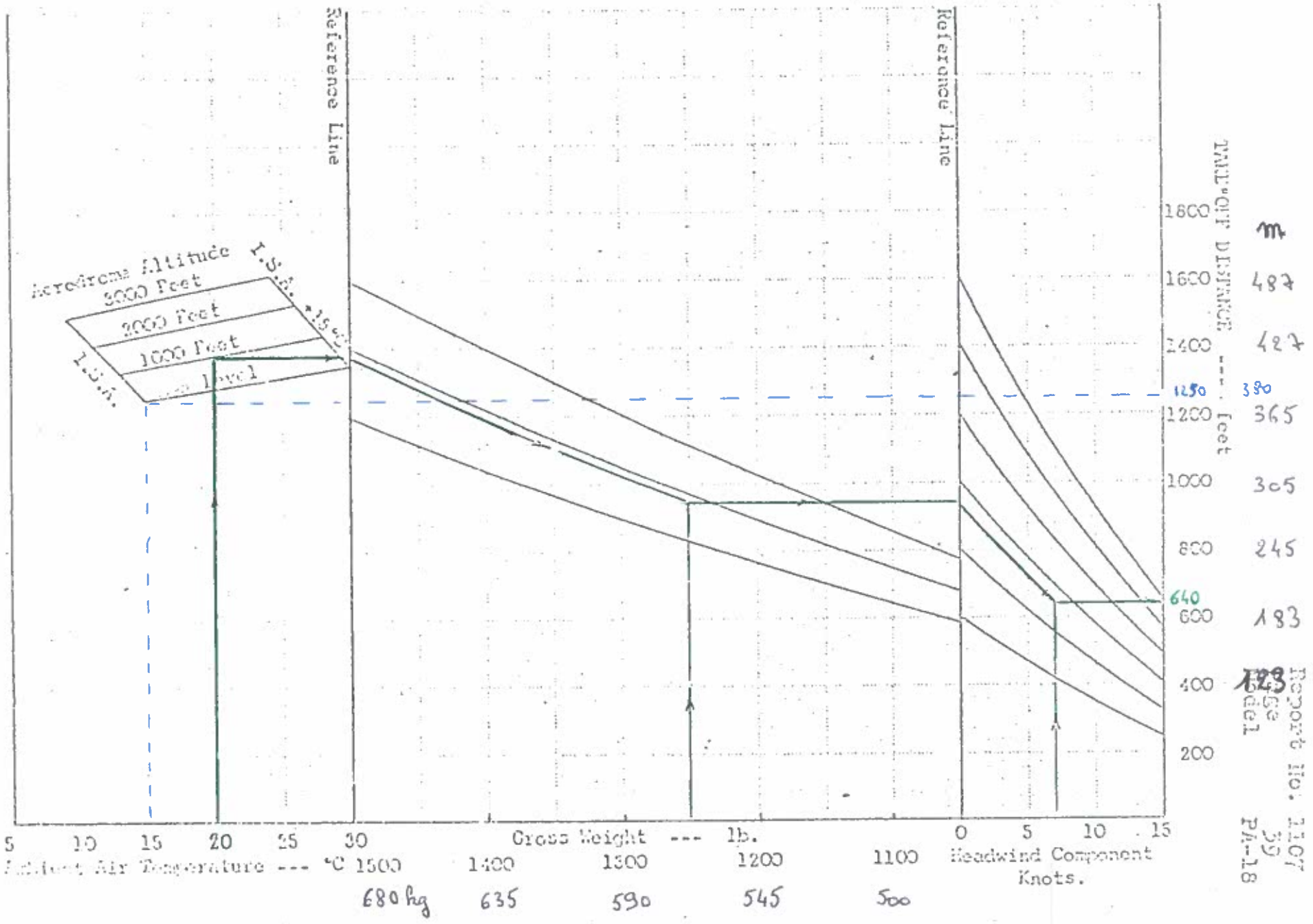
Reference Line
Aerodrome Altitude
5000 Feet
3000 Feet
1000 Feet
Sea Level
I.S.A.
I.S.A. + 15°C
Reference Line
TAKE-OFF DISTANCE --- feet
1800
1600
1400
1250
1200
1000
800
640
600
400
200
m
487
427
380
365
305
245
183
123
Report No. 11107
Issue
Model
PA-18
5 10 15 20 25 30
Ambient Air Temperature --- °C
1500 1400 1300 1200 1100
Gross Weight --- lb.
680 kg 635 590 545 500
0 5 10 15
Headwind Component
Knots.

FIGURE 5-4

NET TAKE-OFF FLIGHT PATH --- NET GRADIENT OF CLIMB

The net gradient of climb from the 50 ft. point to 1500 ft. is shown on page 41 for varying aerodrome altitude, temperature, gross weight and headwind component.

ASSOCIATED CONDITIONS

	Power Unit	Full throttle
	Airspeed	51 m.p.h. I.A.S

EXAMPLE

Given	Aerodrome altitude	1000 feet
	Temperature	20°C(I.S.A. + 7°C
	Gross Weight	1150 lb. 520 kg
	Headwind component	7 knots
The net gradient of climb is		15.5%

NOTE

(1) Carburetor Heat. The use of carburetor heat reduces the gradient of climb by 2.8%.

(2) The radius of a steady "rate one" turn (180° minute) for all conditions scheduled is to be taken as 1430 feet.

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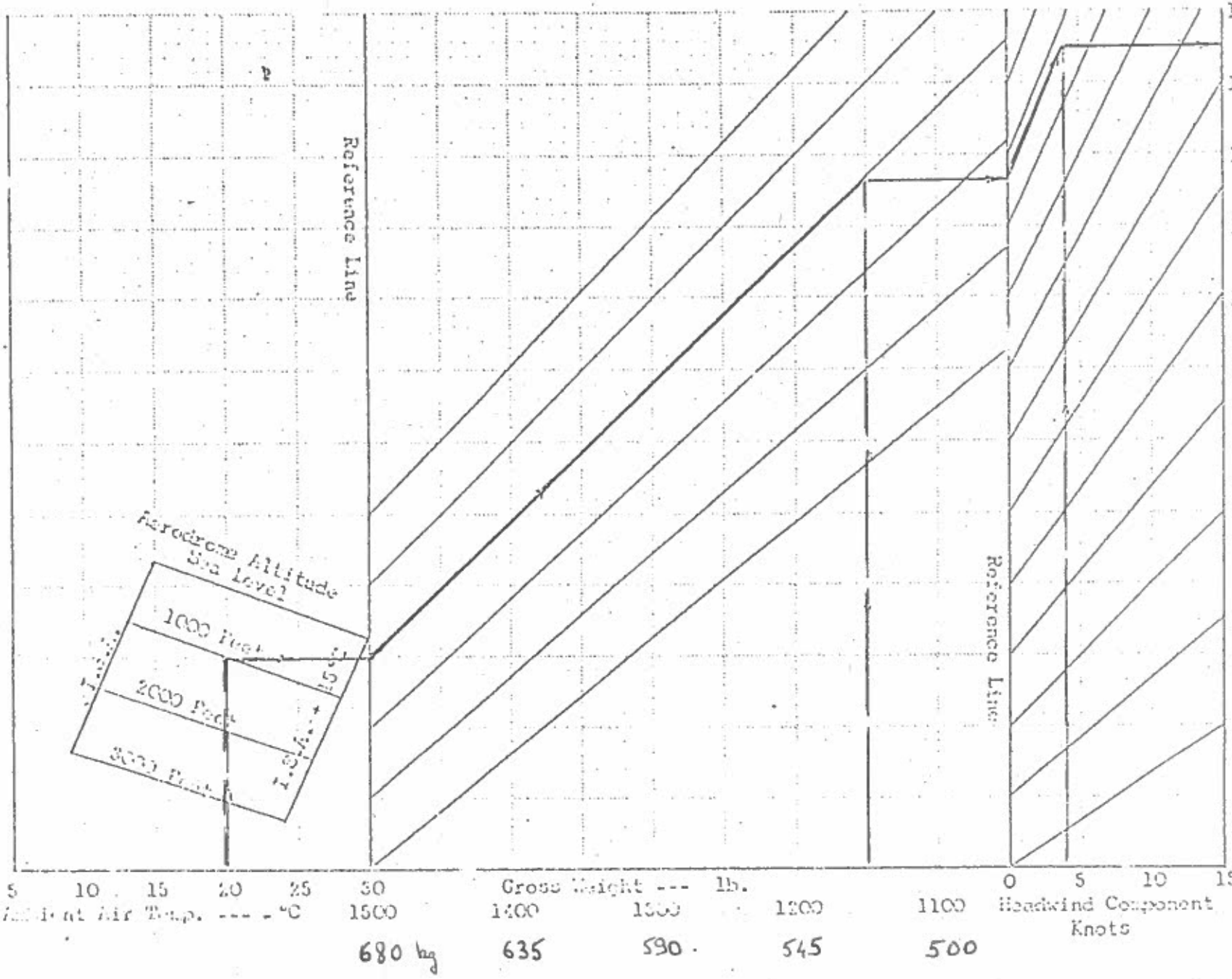
NET TAKE-OFF FLIGHT PATH --- NET GRADIENT OF CLIMB --- %
Reference Line
Aerodrome Altitude
Sea Level
1000 Feet
2000 Feet
3000 Feet
Reference Line
Ambient Air Temp. --- °C
Gross Weight --- lb.
Headwind Component
Knots
680 kg
635
590
545
500

FIGURE 5-5

PERFORMANCE CEILING

The performance ceiling is shown on page 43 for varying weights and temperatures.

ASSOCIATED CONDITIONS

Power Unit	Full throttle
Airspeed	51 m.p.h. I.A.S. (44 knots)

EXAMPLE

Given	Gross Weight	1175 lb.
	Temperature	-4 (°C(I.S.A. +7°C)

The performance ceiling is 13130 feet.

NOTE: This performance ceiling is not a limitation since it does not prohibit an aeroplane flying higher than the ceiling scheduled. (Although at some altitudes the operating regulations may require oxygen to be carried). The performance ceiling represents the maximum altitude which the aeroplane may be regularly relied upon to achieve, bearing in mind the adverse conditions likely to occur. In establishing compliance with that part of the operating regulations which refers to En Route flight, the calculations may not assume that the aeroplane is flying above the scheduled performance ceiling.

PREPARED.....
CHECKED.....
APPROVED.....

PERFORMANCE CEILING

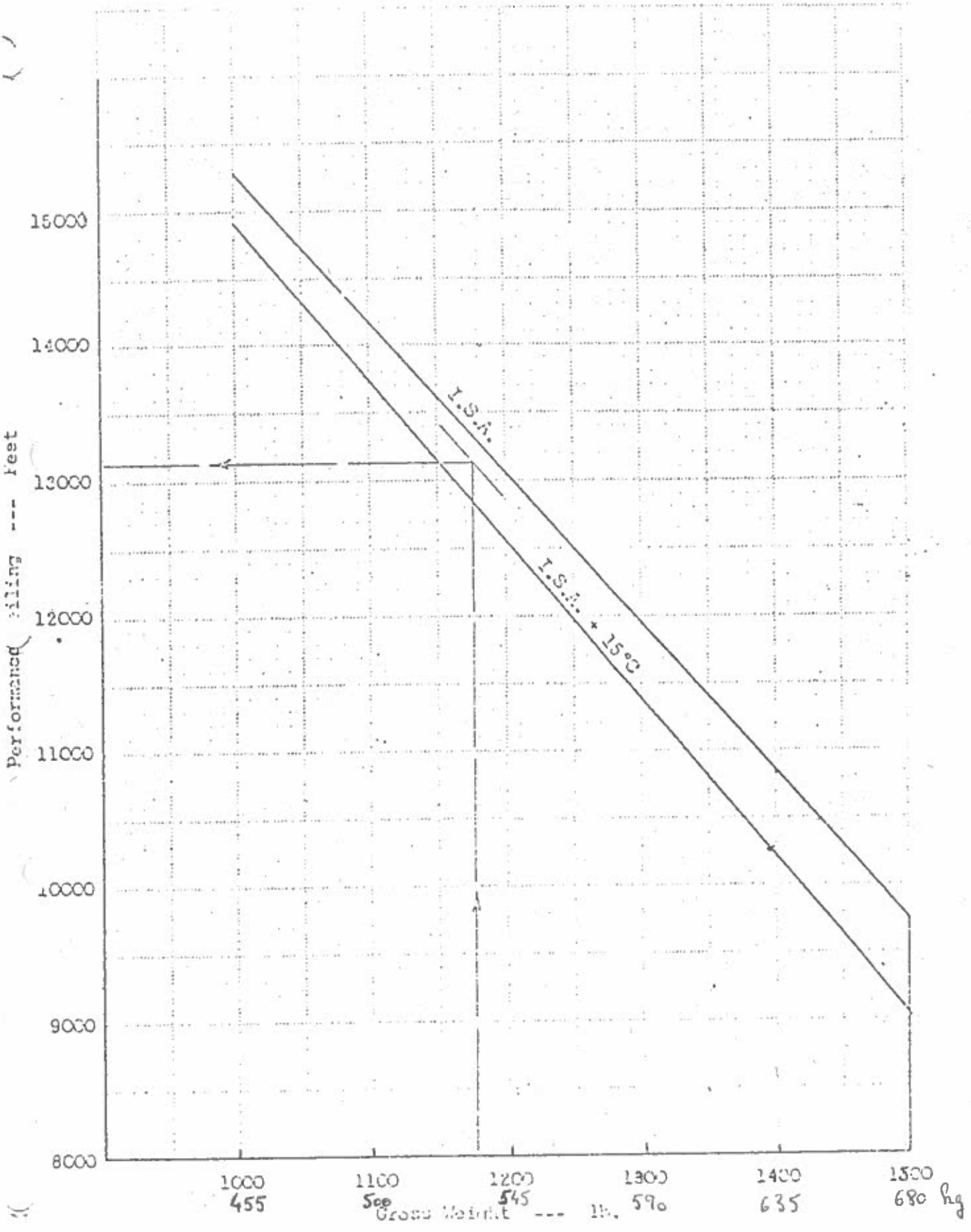

FIG. 5-5

FIGURE 5-6

EN ROUTE GLIDE

(POWER UNIT INOPERATIVE)

The net and gross gradients of descent, expressed as the horizontal distance covered during a given loss of height with the power unit inoperative, are shown on page 44.

ASSOCIATED CONDITIONS

Power Unit	Inoperative
Wing Flaps	Fully Retracted
Airspeed	55 m.p.h. I.A.S.
Wind	Zero wind conditions

NOTE:

(1) In establishing compliance with the appropriate operating regulations the gross gradient scheduled opposite shall not be used, that part of the chart is given for general information only.

(2) The example given by the arrowed dotted line shows that during a height loss of 11,000 ft. a horizontal distance of 16.2 nautical miles will be covered. This distance is independent of the altitude at which the glide is commenced.

(3) The effect of wind should be allowed for in the same way as in a normal navigational calculation.

(4) The effect on the information given opposite of variations in weight may be neglected.

(5) The effect on the information given opposite of variations of temperature may be neglected.

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APPROVED.....

EN ROUTE GLIDE (Power Unit Inoperative)

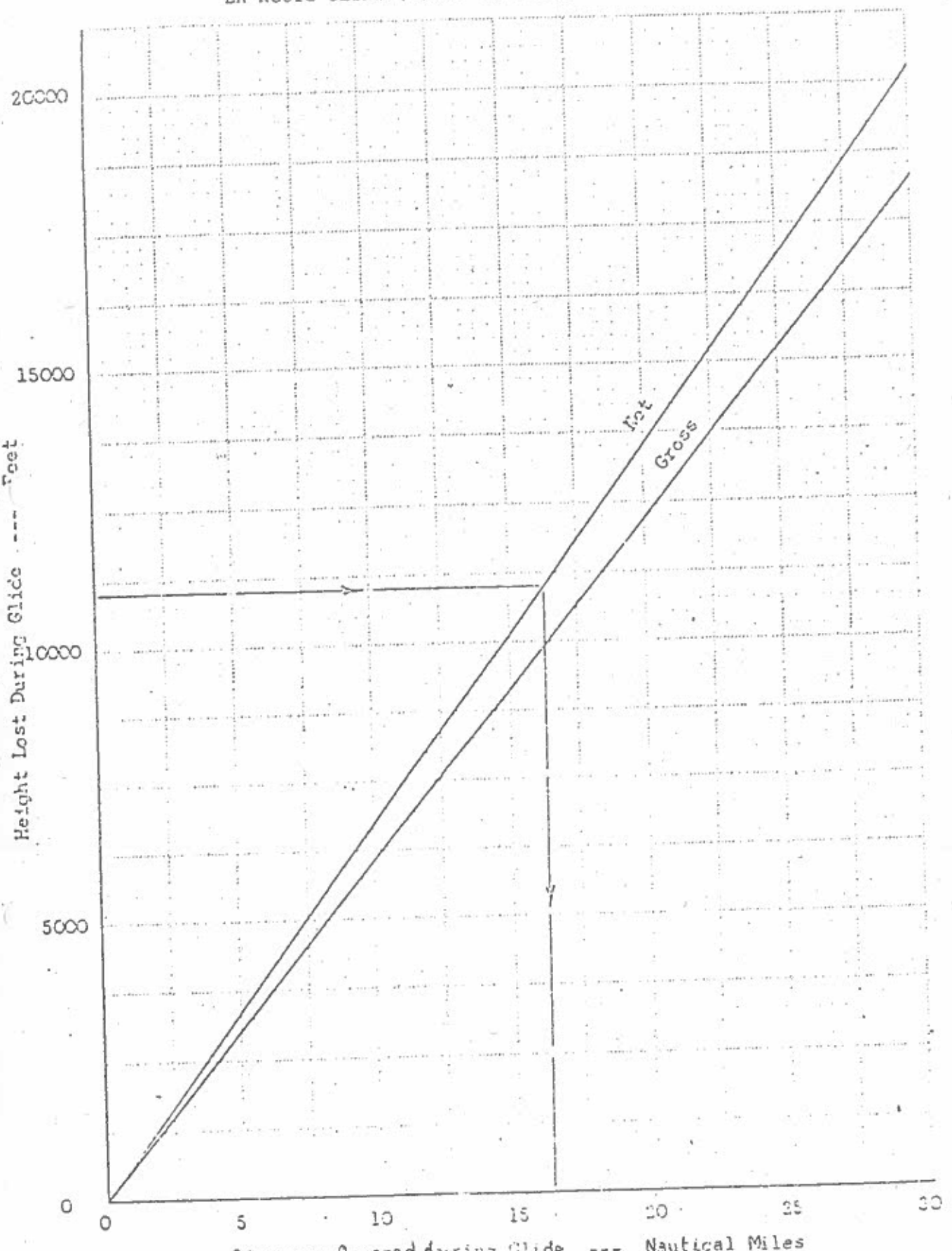

FIG. 5-3

FIGURE 5-7

LANDING DISTANCE

The landing distance from a height of 50 feet to stop is shown on page 48 for varying heights, altitudes, temperatures and headwind components.

ASSOCIATED CONDITIONS:-

Power Unit	Idling
Airspeed	55 m.p.h. I.A.S. down to 50 feet.
Braking	Normal
Runway	Hard, level, dry surface

EXAMPLE

Given	Aerodrome altitude	1000 feet
	Temperature	20°C (I.S.A. + 7°C)
	Gross Weight	1175 lb. 533 kg
	Headwind	7 knots

Landing distance required is 900 ft. 275 m

NOTE:

(1) This landing distance is 'gross data' - i.e. unfactored. The factor to be applied to the landing distance available is given in the relevant operating regulations.

(2) The wind correction grid is unfactored. The reported wind will need to be factored as required by the relevant operating regulations to obtain the effective wind to be used in this chart. For example with a factor of 50% to be applied, a reported headwind component of 14 knots would result in an effective wind of 7 knots to be used in the chart. As the effect of tailwind component is not scheduled, the information given is not valid for a down wind landing.

(3) Correction for the effect of runway surface gradient:

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FIGURE 5

LANDING DISTANCE (Continued)

The landing distance is increased by uniform downhill surface gradient at the rate of 10% increase in distance per 1% downhill gradient. This correction is not applicable for gradients exceeding 2%.

As the effect of uphill surface gradient is not scheduled, the landing distance appropriate to zero surface gradient is to be used when there is an uphill gradient.

PREPARED .....
CHECKED .....
APPROVED .....

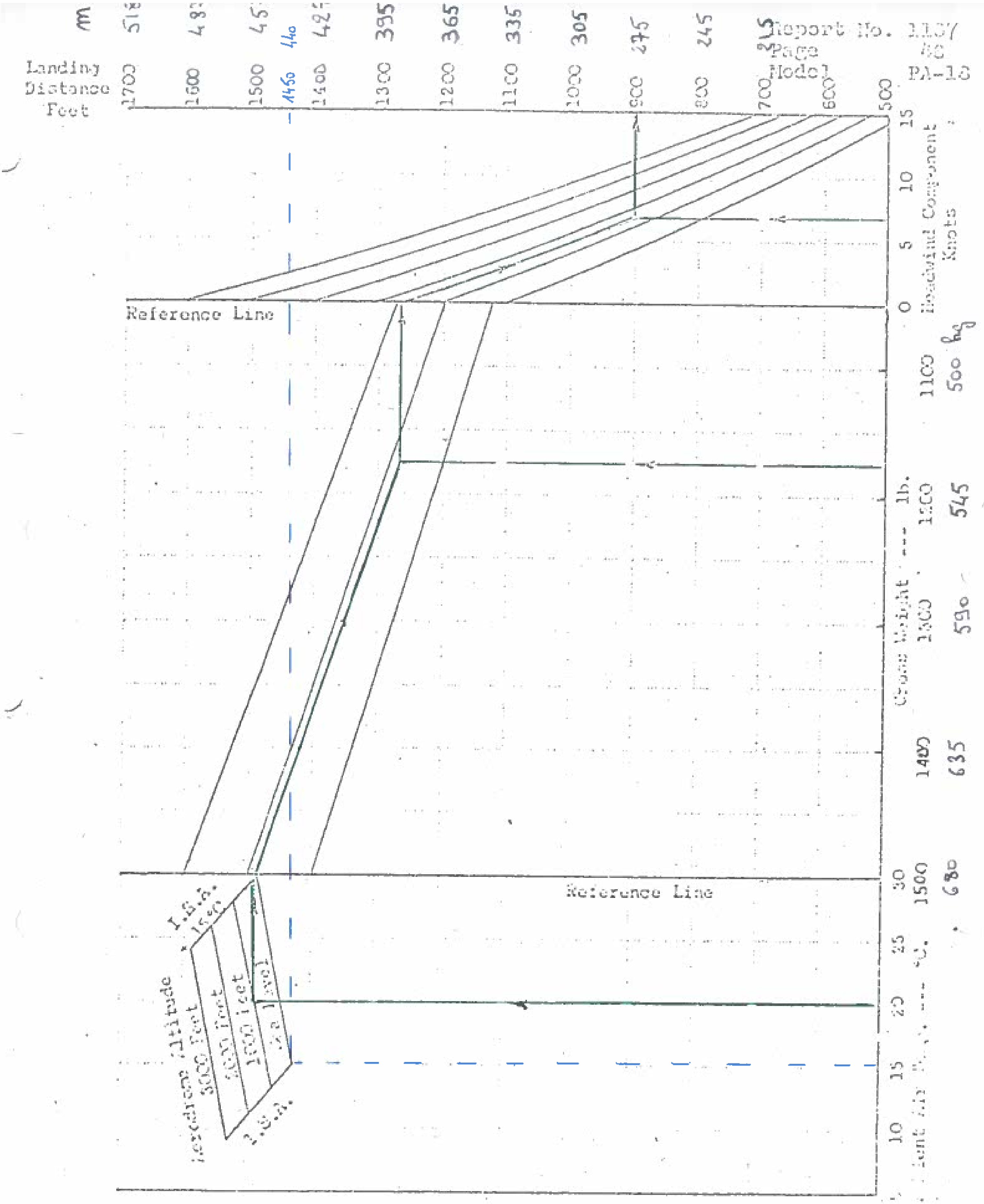
Landing Distance Feet
m
1700 1600 1500 1450 1400 1300 1200 1100 1000 900 800 700 600 500
395 365 335 305 275 245
Reference Line
Reference Line
Headwind Component Knots
0 5 10 15
Gross Weight --- lb.
1100 1200 1300 1400 1500
500 kg 545 590 635 680
Aerodrome Altitude
3000 Feet
2000 Feet
1000 Feet
Sea Level
I.S.A.
10 15 20 25 30

FIG. 5-7

FIGURE 5A-1

EN ROUTE GROSS RATE OF CLIMB

The gross rate of climb is shown on page 50 for varying weights, altitudes and temperatures.

ASSOCIATED CONDITIONS:

	Power Unit	Full throttle
	Airspeed	71 m.p.h. I.A.S. (62 knots)

EXAMPLE

Given	Altitude	6000 feet
	Temperature	6 °C(I.S.A. + 3°C)
	Gross Weight	1200 lb. 545 kg

The gross rate of climb will be 600 ft/min.

CIVIL AVIATION AUTHORITY

CAA Change Sheet No 2 issue 1 to FAA Approved Airplane Flight Manual Report No 1107.

Piper PA18-95	Constructor's Serial No. 18-3447	Registration Marks G-BLLN

EN ROUTE GROSS RATE OF CLIMB ASSOCIATED CONDITIONS

The airspeed figure shown under this heading is 71 MPH (62 KTS).

To be inserted in Approved Flight Manual Report No 1107 facing page 49.

See page 51

FIGURE 5A-1

EN ROUTE GROSS RATE OF CLIMB

The gross rate of climb is shown on page 51 for varying weights, altitudes and temperatures.

ASSOCIATED CONDITIONS:

	Power Unit	Full throttle
	Airspeed	51 m.p.h. I.A.S. (44 knots)

EXAMPLE

Given	Altitude	6000 feet
	Temperature	6 °C(I.S.A. + 3°C)
	Gross Weight	1200 lb.

The gross rate of climb will be 600 ft/min.

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EX ROUTE GROSS RATE OF CLIMB

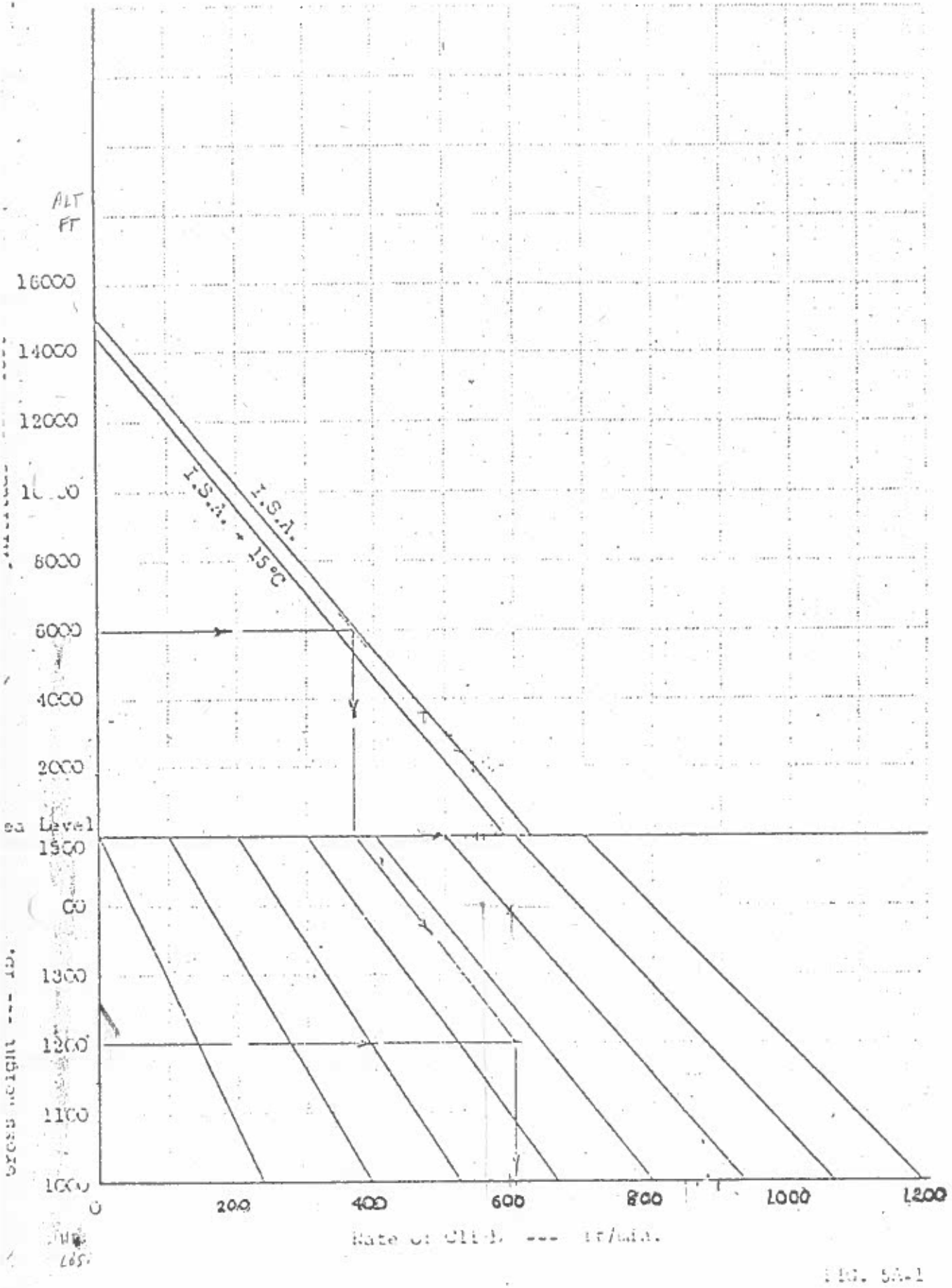

Fig. 5A-1

SECTION VI

WEIGHT AND LOADING DATA

Contents

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CHECKED.....
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SECTION VI

W E I G H T A N D L O A D I N G D A T A

TABLE I

LIST SHOWING WEIGHTS AND LEVER ARMS OF ITEMS OF REMOVABLE EQUIPMENT AND RADIO WHICH ARE NOT INCLUDED IN THE EMPTY WEIGHT GIVEN ON PAGE 15

ITEM	WEIGHT LB	Distance from C.G.Datum* INCHES	
		Fwd. of Datum (i.e.negative lever arm)	Aft of Datum (i.e.positive lever arm)

Continued on next page

*This Datum is defined on Page 15

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CHECKED .....
APPROVED .....

SECTION VI

WEIGHT AND LOADING DATA

TABLE 11

LEVER ARMS

(For General Information)

Station	Distance from C.G. Datum* INCHES: Forward of Datum (i.e. Negative lever arm)	Aft of Datum (i.e. positive lever arm)	
Oil	-36		
Fuel		24	0,61 m
Occupant of front seat		11	0,28
Occupant of rear seat		37	0,94
Luggage Space		57	1,45

*This Datum is defined on Page 13

Revised 6/24/92

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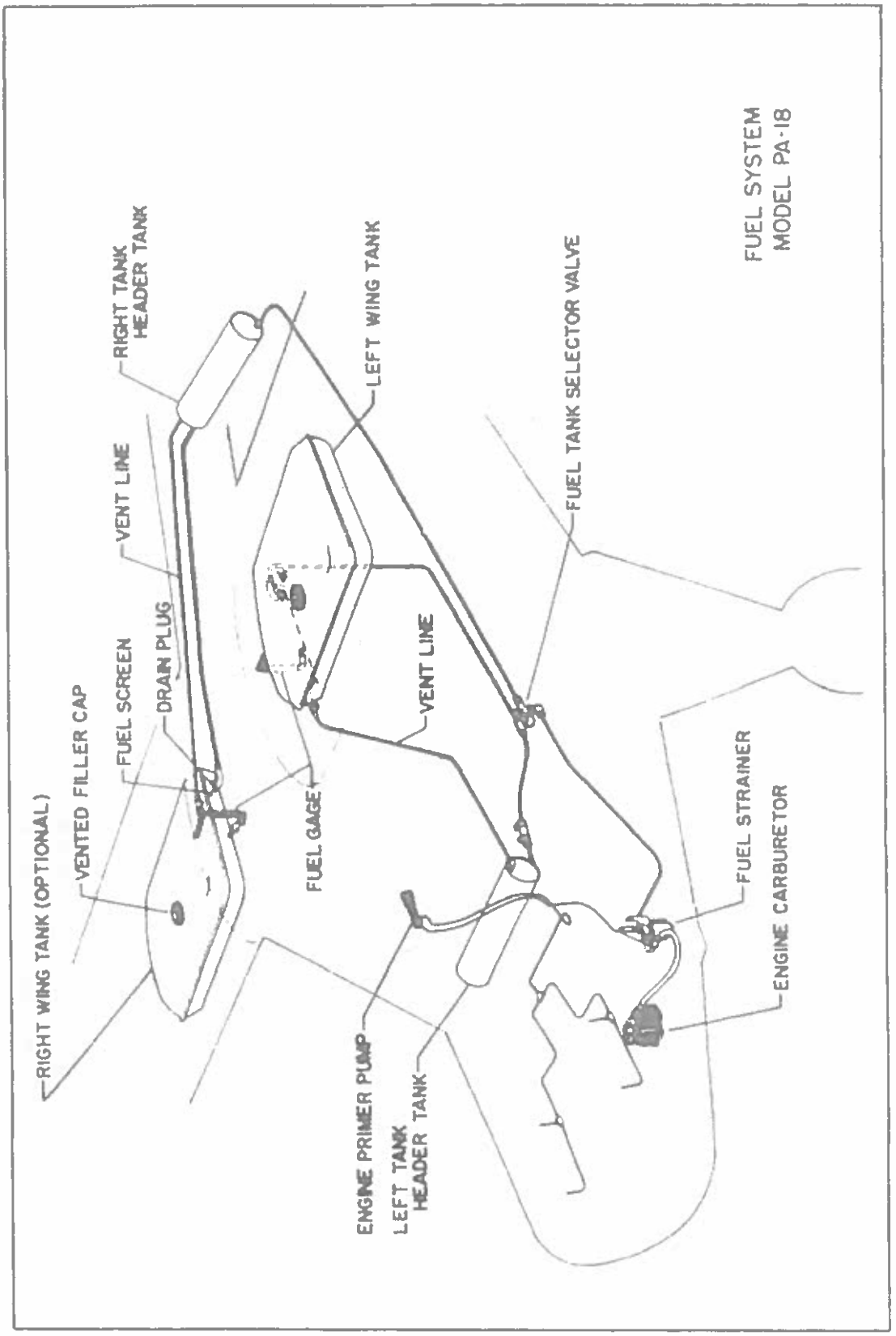

FUEL SYSTEM
MODEL PA-18
RIGHT WING TANK (OPTIONAL)
VENTED FILLER CAP
FUEL SCREEN
DRAIN PLUG
VENT LINE
RIGHT TANK
HEADER TANK
LEFT WING TANK
FUEL TANK SELECTOR VALVE
FUEL GAGE
VENT LINE
ENGINE PRIMER PUMP
LEFT TANK
HEADER TANK
FUEL STRAINER
ENGINE CARBURETOR

The stabilizer adjustment crank is located on the left cabin panel adjacent to the front seat. A permanently automatic tension adjustment, which consists of an idler pulley held in place near the rear main pulley by a tension spring, maintains correct tension on the stabilizer cable and prevents cable slippage. This system normally requires no attention except for lubrication and inspection. Do not lubricate cables.

FUEL SYSTEM

Up to 36 gallons of fuel may be carried in the two 18 gallon fuel tanks, one in each wing.

A small (approximately 2 quarts) header tank, which serves to maintain constant fuel flow to the engine, is included in the installation of each fuel tank. The header tank for the left fuel tank is located forward of the instrument panel. The header tank for the right tank is concealed behind the headlining aft of the rear seat.

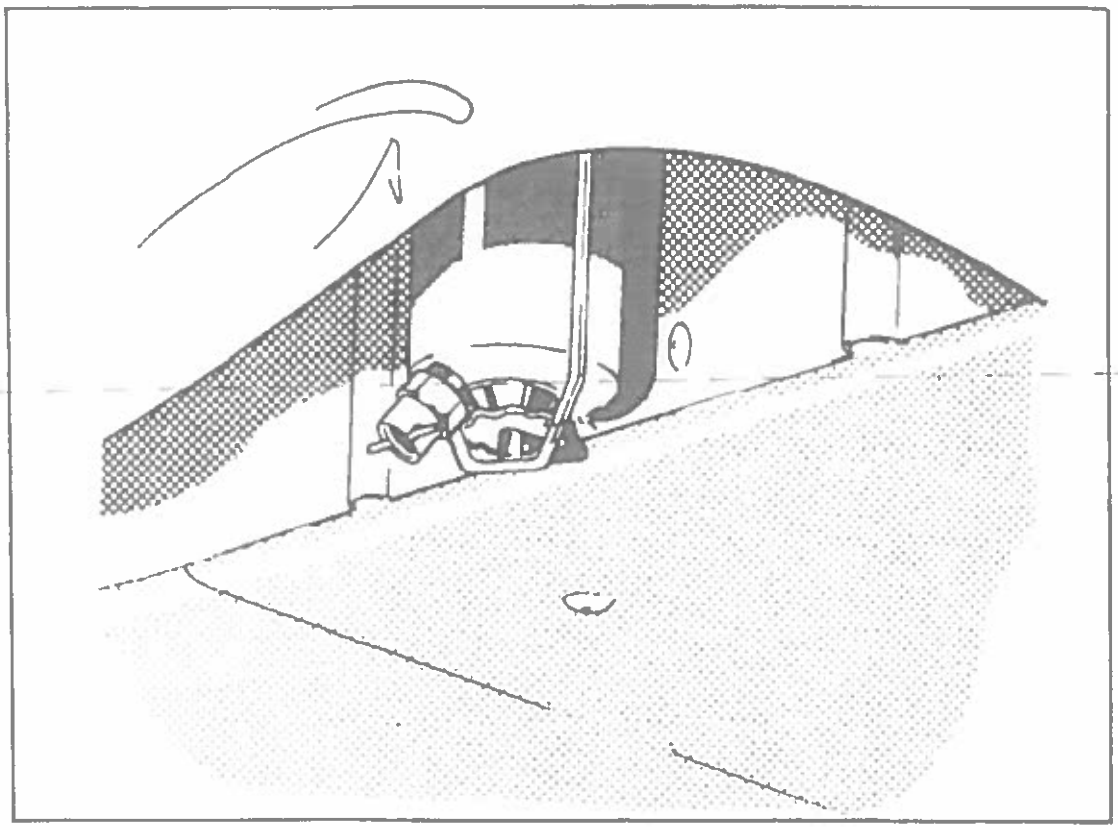
Fuel indicator sight gauges are installed in the upper cabin side panels and are easily discernible from either seat. The fuel shut-off valve is in the left cabin panel near the front seat. Electric fuel gauges are available as optional equipment.

The fuel strainer, on the lower left side of the fire wall in the engine compartment is installed to trap water or sediment that may collect in the fuel system. It should be drained before each flight. Fuel screens are provided at each tank outlet, in the strainer, and at the carburetor.

The engine primer pump on the right side of the instrument panel takes fuel from the top of the fuel strainer and pumps it directly to all four cylinders on the engine. The primer should be locked in at all times, except when in use, to prevent malfunctioning of the engine.

An idle cut-off is incorporated in the carburetor so that full extension of the mixture control stops the flow of fuel at the carburetor. The cut-off should always be used to stop the engine.

Use fuel alternately from the left and right tanks, about one hour each time, to maintain lateral trim.



FUEL STRAINER AND DRAIN

ELECTRICAL SYSTEM

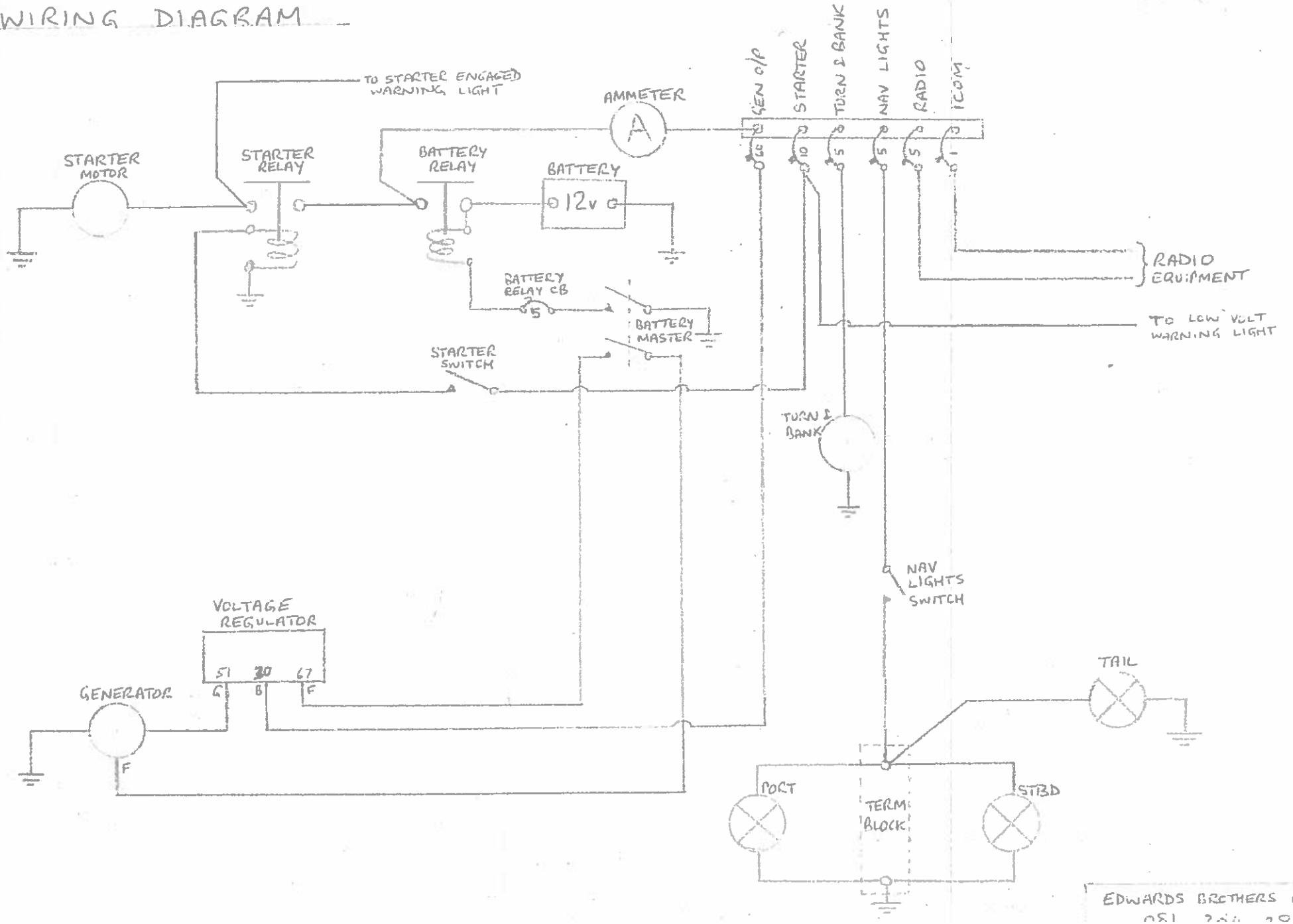
An electrical system, consisting of starter, alternator, battery, voltage regulator, ammeter, starter solenoid, circuit breakers, fuses, switches and related wiring is optional equipment.

A 12 volt, 23-ampere hour battery is mounted in the fuselage aft of the baggage compartment. A master switch and circuit breakers are located on a panel over the right door. The circuit breakers automatically break the electrical circuits if an overload is applied. To reset the circuit breakers simply push in the buttons. A continuous popping of the circuit breakers indicates a short and should be investigated.

The master switch is connected to a master contactor, located near the battery box. The starter solenoid is also mounted near this box.

PIPER CUB G-BLLN

WIRING DIAGRAM



EDWARDS BROTHERS AVIATION

Piper Aircraft Corporation

Lockhaven, Penna.

Section VI

Weight and Loading Data

Table 11

Lever Arms

(For General information)

Station	Distance from C.of G. datum Inches: Forward of datum (i.e. Negative lever arm)		Aft of datum (I.E. positive lever arm)	m
Oil	36	0,91 m		
Fuel			24	0,61
Occupant of front seat			11	0,28
Occupant of rear seat			37	0,94
Luggage Space			57	1,45

The Datum is as defined on Page 13 i.e. —— Wing leading edge

CIVIL AVIATION AUTHORITY
ADDITIONAL LIMITATIONS AND INFORMATION FOR UNITED KINGDOM CERTIFICATION

CAA Change Sheet 1 Issue 7 to the CAA Approved Flight Manual, Report No. 1107.

Piper PA-18 & L-18C	Constructor's Serial No. 18-8447	Registration Mark G-BLLN.

The limitations and information contained herein either supplement or, in the case of conflict, override those in the flight manual.

CATEGORY OF CERTIFICATION

This type of aeroplane is eligible for certification in the United Kingdom in the Transport Category (Passenger).

This particular aeroplane may however be restricted to another category and to a particular use and this will be stated in the certificate of airworthiness.

The statements concerning category made in the Flight Manual are superseded by this change sheet.

GLIDER TOWING

When the aeroplane is fitted with an approved towing hook it may be used for towing gliders provided that the following limitations are complied with.

1. The weight towed shall not exceed the following:-

Glider Classification Group *	Maximum Weight of Glider	
	lb	kg
A	700	318
B	625	283
C	550	249

* As defined in British Gliding Association document entitled "Notes for Tug Pilots"

2. The number of gliders on tow shall not exceed one.

3. The breaking load of the towing cable, or weak link if fitted, shall not exceed 1000lb (454kg) when towing one glider.

CAA Approved
13 January 1992

4. Air speed shall not exceed the maximum permitted speed of the glider under tow.

5. A serviceable cylinder head temperature indicating system shall be installed. The cylinder head temperature shall not exceed 525°F (274°C) and this limitation shall be marked with a red radial line on the cylinder head temperature indicator.

6. Towing must not be carried out when outside ambient air temperature exceeds ISA + 10°C.

7. The pilot only shall occupy the tug aircraft.

8. The fuel quantity in the tug aeroplane shall not exceed 20 Imp.gallons (24 US. gallons).

Towing procedures should be in accordance with those recommended in the British Gliding Association document entitled "Notes for Tug Pilots".

To be inserted in the Flight Manual facing page 16 and the CAA revisions record sheet amended accordingly.

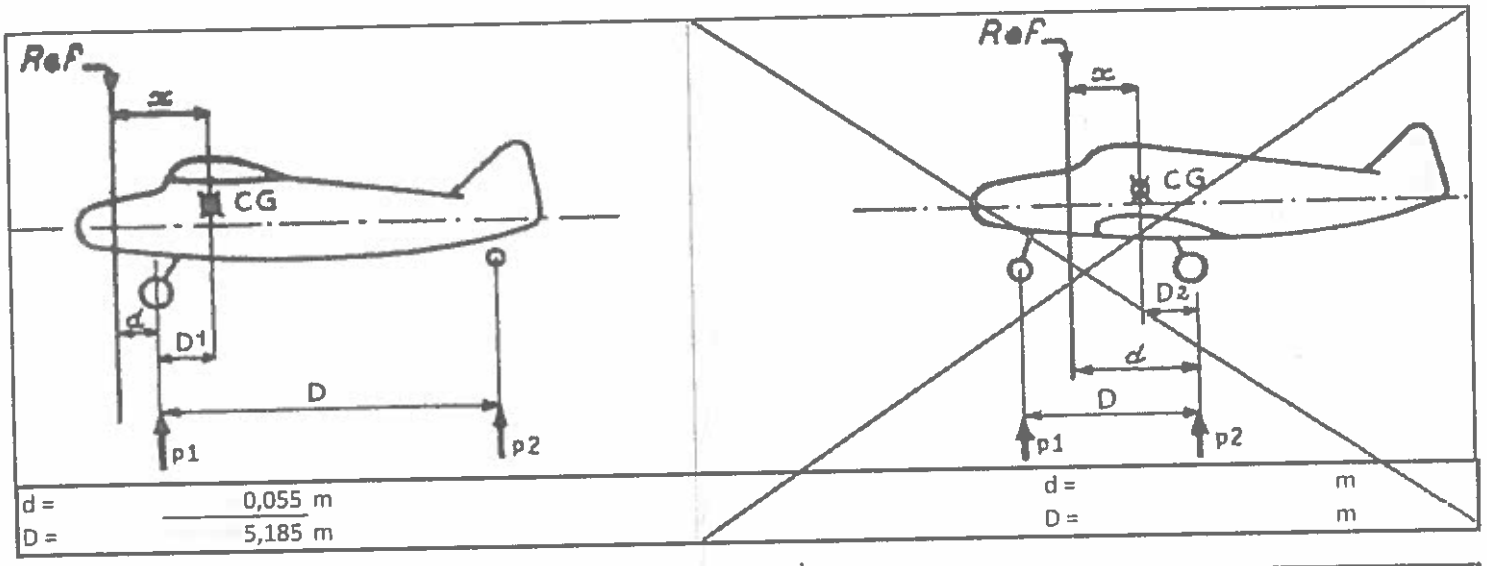
FR.MF 0255 — Appareil : Piper PA-18 — Date : 06/07/2020

RAPPORT DE PESEE

Immatriculation : F-GLLN — Lieu : — Signature :

1

Mise à niveau : Tube longeron G fuselage — Réfenrence : Bord d'attaque de l'aile



d = 0,055 m — d = m

D = 5,185 m — D = m

Distance au C.G.		Masse à vide (kg)	Masse lue	tare	Masse nette	Distance au C.G.
Aux roues principales						Aux roues principales
D1 = (p2*D)/M	0,41159868	Roue G	208	0	208	D2 = (p1*D)/M 0,000
A la référence		Roue D	209,5	0	209,5	
x = d+D1	0,46659868	Roue Av/Ar	36	0	36	A la référence
		Masse à vide mesurée M (kg)			453,5	x = d-D2 0,000

2

CORRECTION(S)

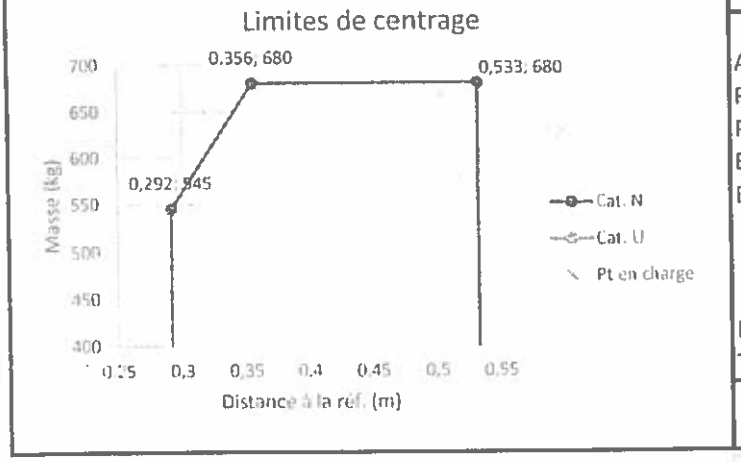
		Masse (kg)	Bras de levier (m)	Moments (p. rapport réf.) (m*kg)
Valeurs lues		453,5	0,467	211,6025
Corrections	+	0	0	0
	+	0	0	0
	+	0	0	0
	+	0	0	0
	-	0	0	0
	-	0	0	0

Masse à vide	453,5	kg
Moments	211,6025	kg.m
Distance C.G. à vide	0,467	m

Huile et essence non utilisable comprises dans la masse à vide

NB : Les corrections sont dans la ligne - pour une masse située **à l'avant de la réf.** (les bras de levier doivent être positifs)

3



Exemple de chargement	Masse	Bras levier	Moment
Avion sec	453,5	0,467	211,6025
Pilote (AV)	77	0,28	21,56
Passager (AR)	77	0,94	72,38
Bagages	2	1,95	3,9
Essence principale (87L)	62	0,61	37,82
	0	0	0
	0	0	0
	0	0	0
Huile	0	0	0
Total	671,5	0,517	347,26

Pesée précédente		
Masse à vide (kg) :		447
date :		20/03/2017

NB : Les bras de levier sont algébriques (signe - si la masse se situe à l'avant de la réf.)